3. STANDARD ICONS AND DRAWING CONVENTIONS

This section provides:

A discussion of the importance of standardized drawing elements and conventions

The standard icons to be used in GCCS architecture drawings

Suggested ways to build on these icons to suit local needs and available tools

Drawing conventions to be followed for GCCS drawings of record and drawings of agreement.

WHY STANDARD ICONS AND DRAWING CONVENTIONS ARE NEEDED

Imagine driving down a road and coming to a yellow traffic light. Instantly, you know what it means and how you are supposed to respond. Now imagine...

- Instead of a light, approaching a flashing sign with the words, "Attention, driver! You better slow down. This lane of traffic is going to have to stop in about four seconds to allow other traffic to pass."
- Coming to a yellow traffic light, but having to consult a chart posted on the side of the road to determine whether yellow means stop, slow, or go in this jurisdiction.
- Coming to an intersection and having to search for the traffic light, which could be above you, on either side of the road, or even mounted in the pavement, and which may have the light colors arranged in any order.

This extreme example highlights the need for standardization. For both traffic signals and architecture drawings, there is a need to develop symbology that is more efficient for communication than written words. The meaning attached to each symbol must be clear and invariable, and the physical presentation of that symbol must be consistent.

GCCS architecture drawings apply a standard set of icons and follow rules that govern the physical placement of those icons. As is the case with the standard terminology presented in the last chapter, standard icons and drawing conventions help to ensure that all members of the GCCS community "speak the same language."

Advantages of Standard Icons

Whether you use a specialized network diagramming tool or merely a general drawing application, the creation of architecture drawings is much faster when a library of standard icons is used. Drawings using icons are easier to use, but the key point here is not just the presence of icons, but the *standardization* of the icons. To be effective, a single icon should carry a distinct meaning, and neither the icon nor its interpretation should vary from drawing to drawing.

Additional benefits can be obtained through the use of advanced architecture tools. Standard icons can be linked to databases that contain specifications on particular components. This feature adds new layers of meaning to the drawing and supports analysis of the architecture.

Advantages of Drawing Conventions

Standards enforce consistency and compliance with an accepted practice, model, or means of expression throughout all members of a community. For the GCCS community, standard drawing conventions simplify the management of a large volume of data on GCCS implementation at numerous military sites.

GCCS drawing conventions speed up the process of creating architecture drawings by providing a basic model to build upon. There is no need for each user to come up with a creative approach to depicting a system – a time-consuming task even for the most artistic of us.

Once you become familiar with the basic conventions, it is much quicker to use drawings that adhere to these rules. What if you have a three-inch stack of drawings and you need to count the number of DOS clients on all of them? If all the DOS clients are diagrammed properly on the lower left of the "H" structure (to be discussed in detail later), then the job can be done fairly easily.

Speed is not the only reason for the conventions described in this section, however. The reason for doing architecture drawings in the first place is to capture and manage information on system configurations and plans. GCCS drawing conventions provide a means to coordinate drawing approval, include assumptions and notes, attach supporting references, and enforce configuration management. Most importantly, they make it possible to see the big picture. Today's drawings fit in the context of last year's baseline and the plan for next year, and your local site's drawings fit in the context of GCCS as an interlocking global system. The ability to see how the pieces fit together is an important aid to both technical problem-solving and managerial decision-making.

Taken together, standard icons and drawing conventions offer many advantages to both the individual GCCS user and to the personnel in charge of maintaining a central archive of GCCS data, as illustrated in Figure 3-1.

Use Word 6.0c or later to

view Macintosh picture.

Figure 3-1.
Benefits of Standard Icons and Drawing Conventions

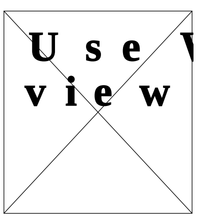
> Using standard icons and following the GCCS drawing conventions is a way to work smarter. These practices allow you to produce and use architecture depictions more efficiently, to enhance the value of the information you maintain, and to comply with the guidelines set forth for managing GCCS architectures.

SOURCES FOR ICONS AND CONVENTIONS

In conducting research for this document, the authors looked for existing government or industry standard icon sets that could be adopted or used as a model for the GCCS standards. No such standards were found. While the engineering community has standardized graphic depictions of electronic components such as resistors and capacitors, standardization of the type of graphic elements needed for architecture work has not been achieved.

A major reason why no standard set of icons has been adopted up to this point is that the same organizations that make sophisticated graphics feasible for architecture work have a vested interest in making their icons look different from everyone else's. For vendors of graphics software (whether architecture-oriented or not), distinctive clip art is an important selling feature.

In selecting icons for GCCS, we have specifically avoided making the GCCS community "vendor-dependent." The icons in this section are drawn from the architecture tools listed in Appendix C, but they are sufficiently generic that you are likely to find something very close to them in a general drawing application or a business clipart package.



For more information on adapting icons to meet GCCS standards or to fulfill local needs, read "Common Sense and Icons: What to Do When Your Icons Don't Look Like Ours," later in this section.

Appendix C presents detailed information on recommended software applications that provide icons appropriate for GCCS architectures.

As with icons, no existing standard for the structure and appearance of architecture drawings could be found. The GCCS Architect relied primarily on logic and common sense to formalize the "H" drawing structure and other features of the standard GCCS architecture drawing.

STANDARD ICONS FOR GCCS ARCHITECTURE ELEMENTS

This section presents the standard icons to be used to represent technical components in GCCS architecture drawings. These technical components are the bits and pieces that must be assembled to build GCCS and its interfaces at each site.

Standard Icon = Image + Text

The standard icons used to depict GCCS architecture consist of a graphic image coupled with English text. The combination of images and text allows for both quick recognition and detailed identification of the element pictured. This point is illustrated in Figure 3-2. In this illustration, there are three subtly different icons represented by the letters A, B, and C. Icon A can be interpreted in a number of ways, especially if the drawing does not print clearly or if the reader is unfamiliar with the item depicted. Icon B clearly states that the icon represents a server, but there is still room for interpretation, as the GCCS architecture can include data servers, application servers, map servers, and others. Icon C eliminates any confusion by identifying the icon as an application server.

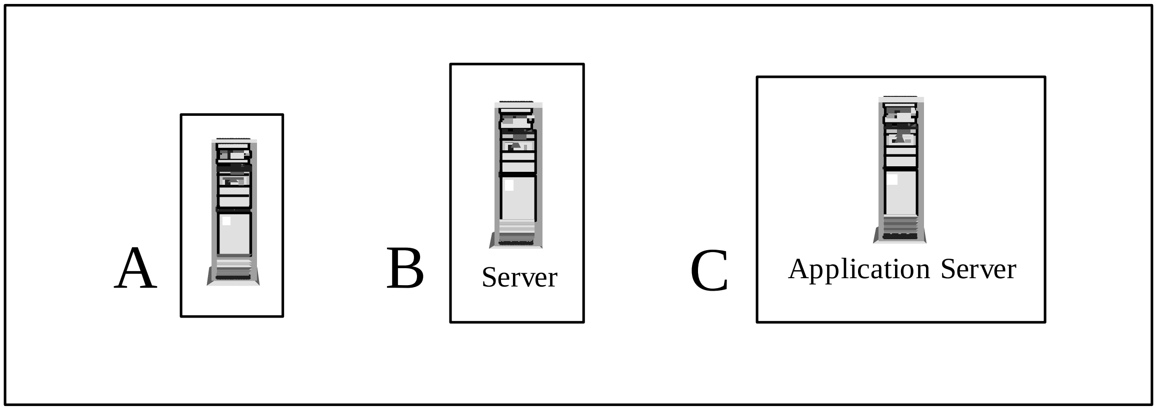


Figure 3-2.
Image + Text Creates the Clearest Icon

Icons and Descriptions

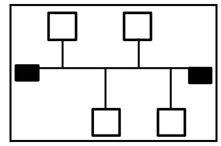
For each of the GCCS standard icons, the following section provides:

- A picture of the icon
- A description of the GCCS component the icon represents
- A bulleted list of attributes appropriate for use with that icon. Depending on your need and on the capabilities of the application you are using, some or all of these attributes (and additional ones as well, as you see fit) may be stored in a database record linked to the icon or may appear in small type below the icon, right on your drawing.

Icons are presented for GCCS network components, internetworking devices, servers, workstations, and peripherals.

GCCS Network (LAN/WAN) Icons

LAN

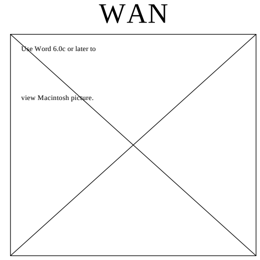


The GCCS network comprises LANs connected together via a wide area network (WAN). A LAN serves users within a limited geographical area, generally not greater than 10 kilometers, over a physical communications channel that supports required data rates. The LAN includes servers, user workstations, the network operating system, and a communications link.

Attributes:

- Type of LAN (e.g., fast Ethernet, Ethernet, Token Ring, Fiber Distributed Data Interface [FDDI])
- Transmission speed inherent in this type
- Number of devices on LAN
- Type of media
- Protocols supported.

WAN

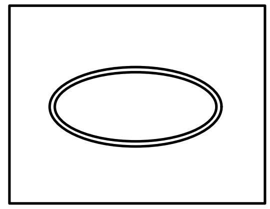


A WAN provides broadband connectivity over large geographical areas by interconnecting LANs. The near-term GCCS WAN will be based on the Secret Internet Protocol Router Network (SIPRNET) for wide area connectivity. The icon shown above is just one of the many ways to represent a WAN in very high-level drawings. The WAN can also be depicted by illustrating the individual LANs and the communications line used to link them together.

Attributes:

- Type of WAN connection (e.g., X.25, FT-1, T-1, 56 kbps, frame relay, ATM)
- Line speed
- Protocols supported.

FDDI

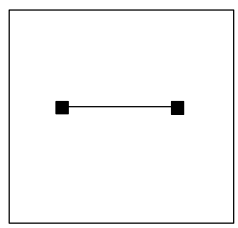


The GCCS LAN architecture encompasses a FDDI backbone . The FDDI backbone will be implemented using a concentrator (i.e., an FDDI network in a box). Each server will be attached to the FDDI through an individual connection to this concentrator. This scheme will facilitate an upgrade to ATM.

Attributes:

- Cable or media (e.g., twisted pair, single-mode fiber, multimode fiber)
- Topology (e.g., dual ring, tree, dual ring of trees)
- Devices on the network (concentrators, SAS, DAS)
- Protocols supported.

Ethernet

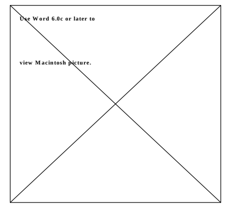


Normally, the data rate required by individual workstations will not require direct connection to an FDDI network. In fact, older workstations and DOS systems will not have data rates high enough to justify such a connection. Thus, Ethernet will provide the data path from clients to the application and data servers .

Attributes:

- Name
- Number of segments
- Physical specifications (e.g., 10Base5, 10Base2, 10BaseT)
- Protocols supported.

Serial lines

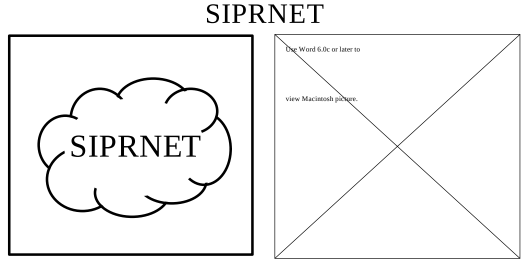


Serial lines are used in the GCCS architecture to connect LANs to remote sites over a large geographical area. These lines support speeds ranging from 9.6 Kbps to 45 Mbps. These lines can be public or private, switched or dedicated , and circuit-, frame- or packet-based.

Attributes:

- Transmission rates
- Leased/private
- Circuit/switched/packet
- Protocols supported .

SIPRNET



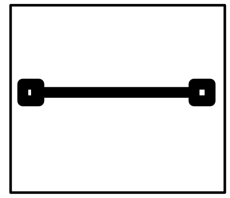
The SIPRNET has various graphic representations, the use of which depends on the element in the SIPRNET you are trying to depict. Any graphic that simplifies something as complex as the SIPRNET to the level of an icon is virtually guaranteed to require supplemental explanation. Details can be provided next to the icon or in notes at the bottom of the page. The SIPRNET is rapidly changing and evolving to meet the needs of its subscribers. The SIPRNET uses routers to connect GCCS nodes and achieve end-to-end connectivity. The GCCS architecture uses the SIPRNET to support the distribution of image processing across the WAN.

Attributes:

- Type of WAN connection (e.g., X.25, FT-1, T-1, 56 kbps, frame relay, ATM)
- Line speed
- Protocols supported.

Cabling (media types)

10BASE5

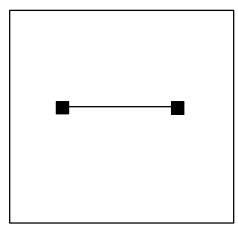


This icon represents thick coax, also referred to as 10Base5. 10Base5 nomenclature stands for 10 Mbps data rate, baseband signal, at 500 meter maximum segment length. The Institute of Electrical and Electronics Engineers (IEEE) physical layer specification calls for double-shielded RG-11 coaxial cable. Devices are attached with a tapping device. This cable requires terminators at both ends.

Attributes:

- Segment Name
- Number of nodes/stations
- Node type (e.g., PC, workstation, printer) .

10Base2

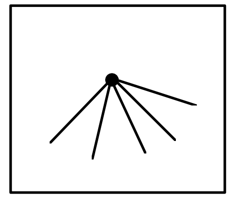


This icon represents thin coax, also known as 10Base2. 10Base2 nomenclature stands for 10 Mbps data rate, baseband signal, at 185 meters maximum segment length. Physical layer specifications for thin cable (sometimes called cheapernet or thinnet) are RG-58 coaxial cable. Devices are generally connected by daisy chaining using BNC or T connectors. This cable requires terminators at both ends.

Attributes:

- Segment name
- Number of nodes/devices
- Node type.

10BaseT

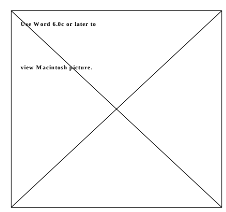


10BaseT is the IEEE standard for twisted pair Ethernet. The nomenclature stands for 10 Mbps data rate, baseband, twisted pair cabling. This cabling is relatively inexpensive, light, and small. It supports a star-wired topology. The maximum segment length is 90 meters.

Attributes:

- Number of connections
- Location of connections (location of hubs and location of end users)
- Type of node.

Fiber



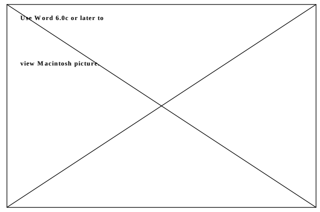
Fiber optic cabling is gaining great popularity. The cost of fiber is continuing to decrease rapidly. Fiber optic cabling is lightweight and smaller than any other media. It provides coverage over greater distances, and is virtually impervious to electromagnetic and radio frequency interference or noise. Physically, fiber is supported by a point-to-point link. Depending on the layout, fiber can support a ring, bus, or star topology. Fiber optic cabling has the greatest potential bandwidth of any cabling type, making it capable of supporting GCCS needs well into the future.

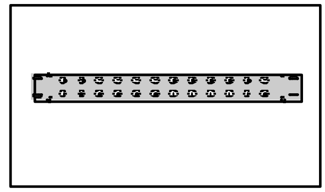
Attributes:

- Type (single or multimode)
- Network supported (10BaseF, or FDDI)
- Termination points
- Number of strands in use/spare.

Patch Panels

RJ45 Patch Panel   Fiber Patch Panel





Patch panels are used in networks to patch cables together to provide connectivity to the network for network devices. Patch panels are widely being implemented in standard wiring designs because they allow flexible configuration (easy additions and changes to the network), cable management, and troubleshooting. These icons represent patch panels for twisted pair and fiber cables.

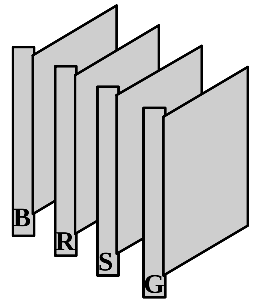
Attributes:

- Type of patch panel (RJ-45 or fiber)
- Number of connections or ports
- Manufacturer
- Number of active and spare connections
- Purpose, IDF, main, or end-user patch.

Internetworking Devices

Intelligent Hub

Bridge, Router, Switch, Gateway Modules



The icon to the left is used to represent intelligent hub/concentrator hardware included in the GCCS architecture. Hub hardware is used to establish a centralized node for connection of various circuits encompassed in a network. Hubs can be passive, active, or intelligent. Passive hubs add nothing to the data being transmitted. Active hubs regenerate signals and may perform limited network management functions. Intelligent hubs are computers that support network management and may include bridging, switching, routing, and gateway capabilities. These capabilities are provided via a bridge module, router module, switch module, or gateway module inserted in the intelligent hub chassis. The icons to the right illustrate the different hub modules.

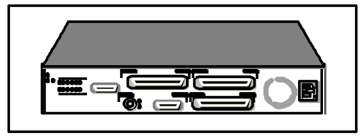
Attributes:

- Manufacturer and model number
- Maximum number of connections
- Type of modules (bridge, switch, router, and gateway)
- Type of connections (serial, Ethernet, and FDDI)
- Backplane configuration (single-bus, multibus)
- Aggregate bus speed
- Number of slots, slots in use, slots available
- Network management support.

!

Internetworking devices such as bridges, switches, routers, and gateways can also be standalone units instead of modules in an intelligent hub. The icons that depict standalone units follow.

Router

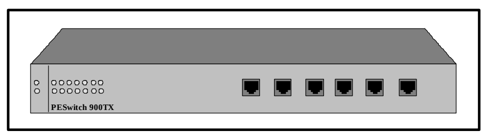


Router hardware is used to ensure proper communications connectivity for support of data transmission. The router identifies, selects, and interfaces the proper telecommunications path to provide end-to-end data communications connectivity .

Attributes:

- Manufacturer and model number
- Configuration
- Number of ports, in use and available
- Protocols supported
- Special features
- Forwarding rate
- Filtering rate
- Network management support
- WAN support (e.g., X.25, T-1, RS-445)
- LAN support (Ethernet, FDDI, token ring).

ATM Switch

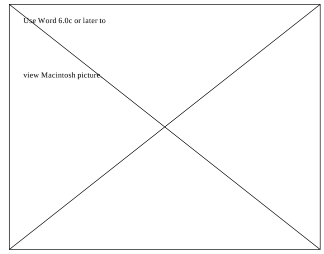


The GCCS Architecture for the near term includes CISCO routers to connect GCCS servers with the SIPRNET for end-to-end communications connectivity. Limitations in the speed of operation of CISCO routers will require their replacement when improvements to the SIPRNET are implemented. Therefore, eventual upgrade to ATM/Synchronous Optical Network (SONET) from the local site will be required.

Attributes:

- Manufacturer and model number
- Number of ports, in use and available
- LAN interfaces
- Port speed connectivity
- Throughput speed/switching matrix
- WAN interface support (e.g., X.25, T-1, RS-445)
- Network management support.

FDDI Concentrator

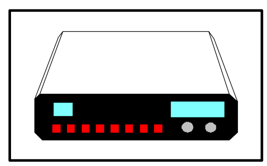


An FDDI concentrator is a device that joins several communications channels together, thereby allowing more users to share the transmission channels for data communications.

Attributes:

- Manufacturer and model number
- Number of ports, in use and available
- LAN interfaces
- Port speed connectivity
- Throughput speed/switching matrix
- WAN interface support (e.g., X.25, T-1, RS-445)
- Network management support.

Modem



A modem is a device which converts digital to analog signals and restores analog signals back into digital signals for transmission over a network.

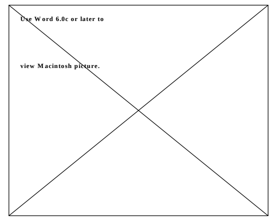
Attributes:

- Manufacturer and model number
- Standards supported
- Compression support
- Network management support.

GCCS Servers

GCCS servers are dedicated computers on a dedicated communications network. Servers are used to store information and/or manage specialized functions centrally for the network. The GCCS servers provide the data storage, backup, recovery, gateway, and security services required by the LAN. The specific quantity and type of GCCS servers available at any GCCS location is contingent on the unique processing requirements of each GCCS location. The GCCS architecture server environment encompasses a suite of servers dedicated to specific GCCS requirements, including terminal servers, application servers, and data servers. The operations/intelligence server and map server icons represent components that individual sites may wish to add on to their networks to support local requirements.

Terminal Server



GCCS terminal servers may be used to provide connectivity to organizations with a large number of remote GCCS subscribers with Secure Telephone Unit (STU)-III terminals.

Attributes:

- Manufacturer and model number
- Number of ports and lines
- Memory/storage capacity
- Software
- Protocols supported
- Network management support
- Routing support
- LAN connection.

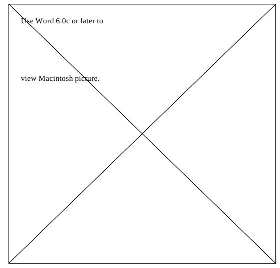
?

The terms terminal server and communications server are sometimes used interchangeably. What's the difference?

A terminal server connects asynchronous peripherals (e.g., terminals, modems, printers) to a LAN. It provides multiple dial-in connections for terminals to communicate over the network and to access the terminal host. Terminal servers communicate with computers using Transmission Control Protocol/Internet Protocol (TCP/IP) or LAN protocols.

A communications server is usually associated with communications software. It provides many different services, including terminal server capabilities along with print and fax services. A communications server is generally used as part of PC-based remote access solutions supporting remote control or remote node configurations. It provides more advanced features for interoperability, remote access, and security.

GCCS Apps Svr

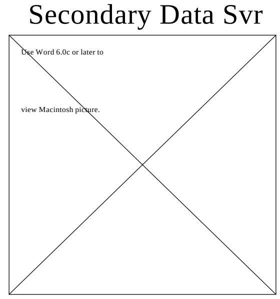


An application server is a specialized computer that manages storage and retrieval of applications shared by users on the network. The number of applications servers required at a given GCCS location is dependent on the number of users served and the size of the applications loaded on the applications server. Until GCCS applications migrate to a common operating environment, a great deal of random access memory (RAM) and processor speed is required to operate many of the planned applications simultaneously. As a result, GCCS sites may need to add application servers and/or RAM to local GCCS configurations.

Attributes:

- Operating mode (primary, backup, standby)
- Manufacturer and model number
- Operating System
- Applications running (major)
- Memory/storage capacity
- Disk storage capacity
- Redundant Array of Inexpensive Disks (RAID) level
- Number of Central Processing Units (CPU)
- Number of peripherals
- LAN interfaces
- CPU speed (in Megahertz [MHz]).

Primary Data Svr
(or)
Secondary Data Svr

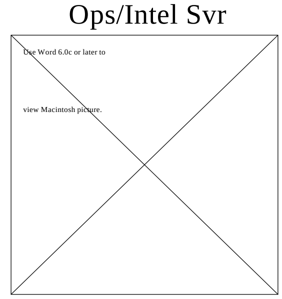


A data server is a specialized computer dedicated to the storage and retrieval of data. The GCCS architecture includes a primary and secondary data server. Data servers require extensive amounts of RAM to handle the data demands of the many applications that are constantly accessing stored data. CPU speed and RAM are two factors that local units must consider in sizing their requirement for hard disk space and additional data servers.

Attributes:

- Operating mode (primary, backup, standby)
- Manufacturer and model number
- Operating System
- Applications running (major)
- Memory/storage capacity
- Disk storage capacity
- RAID level
- Number of CPUs
- Number of peripherals
- LAN interfaces
- CPU speed (in MHz).

Ops/Intel Svr



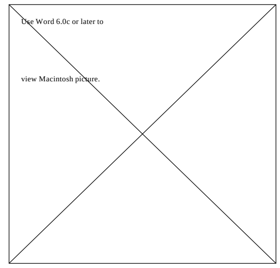
A separate server may be added to the GCCS configuration to satisfy local requirements for a dedicated interface between operations and intelligence. No site has yet implemented an operations/intelligence server, but the GCCS architecture can accommodate such an addition. Candidate systems serving the intelligence community may be able to fill this role.

Attributes:

- Operating mode (primary, backup, standby)
- Special interfaces
- Manufacturer and model number
- Operating System
- Applications running (major)
- Memory/storage capacity
- Disk storage capacity
- RAID level
- Number of CPUs
- Number of peripherals

- LAN interfaces
- CPU speed (in MHz).

Map Svr

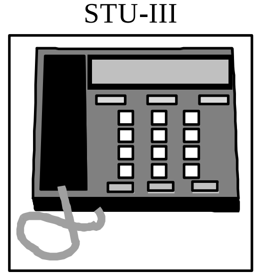


A separate server may be added to the GCCS configuration to satisfy local requirements for a dedicated mapping server. No site has yet implemented a mapping server, but the GCCS architecture can accommodate such an addition. A dedicated mapping server may be used by GCCS users on a local node who have extensive mapping, charting, and geodesy needs. A dedicated map server reduces the loading on applications servers at those GCCS locations with large requirements for video and image transfers.

Attributes:

- Operating mode (primary, backup, standby)
- Compact Disk–Read Only Memory (CD-ROM) support
- Manufacturer and model number
- Operating System
- Applications running (major)
- Memory/storage capacity
- Disk storage capacity
- RAID level
- Number of CPUs
- Number of peripherals
- LAN interfaces
- CPU speed (in MHz).

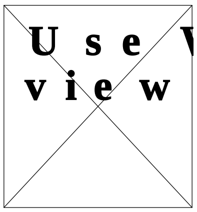
STU-III



Remote GCCS subscribers may use STU-III data port capabilities to access the GCCS network and services. Some GCCS sites must support a large number of remote subscribers via STU-III terminals. A separate server is recommended for this purpose (see the terminal server discussion, at the beginning of this subsection).

Attributes:

- Manufacturer and model number
- Line number
- Support for unattended operation.



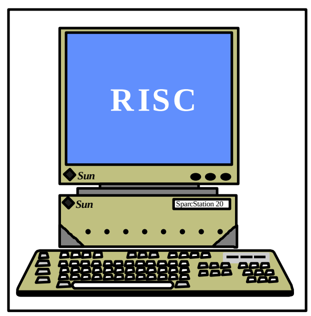
Wait a minute – that's not a STU-III!

Yes, we know. Not every icon will look exactly like its real-life counterpart. How do you make the best of the graphics you have, communicate your meaning, and still stick with the standards? Refer to the section following the peripheral icons, called "Common Sense and Icons."

GCCS Workstations

The GCCS architecture supports both DOS-based and UNIX-based (RISC and CISC) client workstations.

RISC UNIX



Modern RISC-based UNIX workstations are ideal for accomplishing GCCS functions. These workstations should have as many day-to-day applications as possible on the hard disk to avoid loading the network with office automation tasks.

Attributes:

- Manufacturer and model number
- Number of CPUs
- CPU speed (in MHz)
- Operating system
- Major applications
- Memory (RAM , VRAM, DRAM))
- Disk storage capacity
- Number of peripherals
- LAN interface (adapter card).

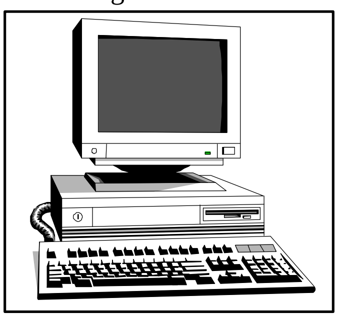
CISC UNIX

UNIX workstations based on powerful CISCs are a less expensive alternative to large workstations . Both RISC and CISC workstations need a 32 bit graphic board with two megabytes of Virtual Random Access Memory (V RAM) or Dynamic Random Access Memory (DRAM) to provide an adequate video processing speed.

Attributes:

- Manufacturer and model number
- Number of CPUs
- CPU speed (in MHz)
- Operating system
- Major applications
- Memory (RAM , VRAM, DRAM)
- Disk storage capacity
- Number of peripherals
- LAN interface (adapter card).

High-End DOS



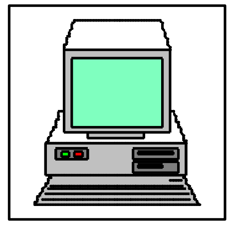
DOS workstations that are 386 or higher are supported by the GCCS configuration.

Attributes:

- Manufacturer and model number
- Number of CPUs
- CPU speed (in MHz)
- Operating system
- Major applications

- Memory (RAM)
- Disk storage capacity
- Number of peripherals
- LAN interface (adapter card).

Low-End DOS



This icon represents any type of low-end and legacy workstations intended by the site to be utilized in the GCCS architecture . Although older workstations can be useful for text and table-based data operations if extensively upgraded, it is recommended that high-end equipment be purchased and that older equipment be reallocated within the purchasing organization.

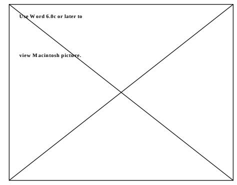
Attributes:

- Manufacturer and model number
- CPU speed (in MHz)
- Operating system
- Major applications
- Memory (RAM)
- Disk storage capacity
- Number of peripherals
- LAN interface (adapter card).

Legacy systems and low-end workstations must be equivalent of a 386 or higher to be supported as clients by the GCCS configuration .

Peripherals

Printer

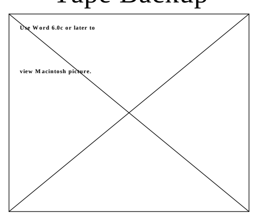


This icon can be utilized to represent a personal printer or a shared network printer.

Attributes:

- Manufacturer and model number
- Type (laser, inkjet, dot matrix)
- Capacity (in pages per minute or characters per second)
- Support for color
- Resolution (in dots per inch [dpi])
- Network connection
- Connection to print server.

Tape Backup

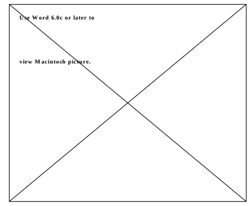


Tape backup units are used to store and restore critical information and applications.

Attributes:

- Manufacturer and model number
- Capacity and format
- Automatic changer
- Network connection
- Protocols supported
- Backup formats
- Software.

Scanner

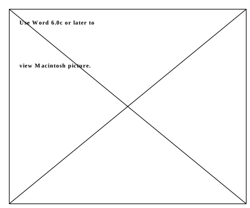


A scanner can be used to scan images or text documents into an application or file.

Attributes:

- Manufacturer and model number
- Resolution
- Support for color
- Connection to workstation or network, and names of available Optical Character Recognition (OCR) and image manipulation software
- Manual or automatic feed.

CD-ROM

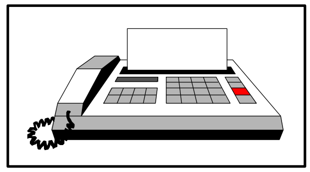


CD-ROM media can store large amounts of information, and CD-ROM drives are able to retrieve large quantities of information in a relatively short period of time. CD-ROMs are common storage media for databases, catalogues, map archives, encyclopedias, and similar large-volume references. CD-ROM drives are available for both DOS and UNIX workstations.

Attributes:

- Manufacturer and model number
- Drive speed (double, triple, quad, or six-speed)
- Storage capacity
- Access time
- Throughput rates
- Number of drives
- Operating system supported.

FAX

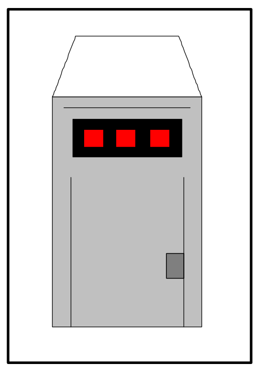


The facsimile (FAX) is used for transmitting text and graphical information over the network.

Attributes:

- Manufacturer and model number
- Transmission rate supported
- Network interface
- Outgoing interface
- Buffer size
- Management support
- Gateway support.

UPS



An uninterruptible power supply (UPS) is used to safeguard equipment and prevent data loss caused by voltage spikes, surges, brownouts, and blackouts. The UPS provides a regulated and constant power source that turns on when the a steady flow of power is interrupted. Critical components in a network such as hubs, bridges, and routers are typically connected to the UPS.

Attributes:

- Manufacturer and model number
- Rating (in volt-amperes)
- Output load
- Backup time
- Recharge time
- Hot swap capability
- Management support.

!

UPS facilities that support the entire environment do not have to be represented everywhere in the architectural drawing, but should be identified in the "notes" section of the drawing.

Common Sense and Icons:
What to Do When Your Icons Don't Look Like Ours

Common sense is the key to applying the guidance on icons that is contained in this document. We recognize that the icons presented here do not cover every piece of equipment that will be connected to GCCS. It is also clear that everyone will not have the same tools at hand to produce architecture drawings. So what do you do?

- First, don't panic. Your drawings will not be rejected if your icons are not exactly identical to the ones provided here.
- Build on the icons provided here. Suppose you need an icon for a plotter. The simplest solution is to take the standard printer icon and place the label "plotter" at the top. The icon certainly doesn't look like the real thing, but functionally it is similar, and the label at the top clarifies its purpose and use
- Don't get too elaborate. Sure, you could take digital photographs of your equipment and use those as highly accurate icons, but is the improved accuracy worth huge file sizes and sluggish scrolling and printing? Also beware of developing such artistic icons that you need to examine them closely to tell them apart – this undermines the point of using icons in the first place.
- Never let the lack of a specific drawing package or icon keep you from getting your point across.

GCCS Drawing Conventions

This section describes the drawing conventions to be followed in developing GCCS architecture depictions. These conventions cover how architecture elements are arranged and linked spatially, and what information appears on the drawing page. "Page" in this context is a term of convenience. referring to an architecture view on a computer screen as well as a printed page.

The guidance in this section is to be followed to the maximum extent possible for drawings of record that document GCCS implementation and for drawings of acceptance submitted to the GCCS Architect. This requirement in no way infringes on your ability to communicate and conduct your daily business in any way you see fit. Any format you prefer can be used for briefing slides and for management and engineering drawings created for strictly local purposes. However, to maintain consistency among your records and to familiarize your staff with the formal conventions, we suggest that you consider applying these conventions to local documentation whenever practical, so that the use of the conventions becomes second nature to your staff.

The intent of these conventions is to enforce *meaningful* consistency. Items that are not specifically standardized (e.g., type font) are left up to individual preferences and common sense.

The standard drawing page has seven primary areas:

- Drawing title
- Architecture layout
- Notes, assumptions, reference pointer
- Registration number
- Signature block (if required)
- Version number
- Drawing tool.

In addition to the standard elements that appear on the primary electronic or hard-copy page, there may be supporting information in a linked database, or in supplemental files or printed pages.

Each area and the related conventions is described in detail in the following subsections.

Drawing Title

Titles are required for all GCCS drawings. The following conventions apply to titles for GCCS drawings:

- Use all caps
- Center the title on the top line of the drawing below the drawing frame.

Placement of the title is shown in Figure 3-3.

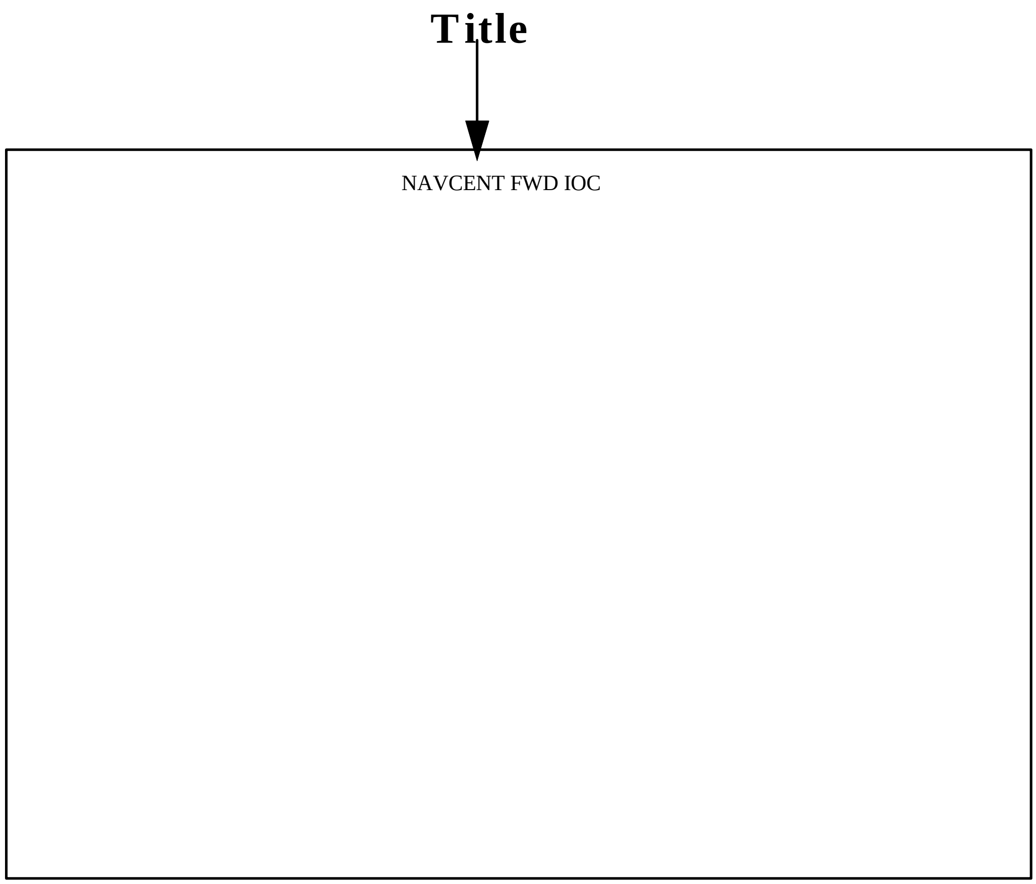


Figure 3-3.
Drawing Page Title

Architectural Morphology

This section covers the arrangement of the icons that represent the GCCS architecture on the notional page. The term “morphology” simply refers to the structured location of particular elements on specified parts of the page.

The standard GCCS morphology consists of five areas that together make an “H” shape, hence the term “H” drawings. The five areas represent internal network and system connectivity and interfaces, LAN connectivity local to the organization, external network and system connectivity and interfaces, DOS workstations and legacy systems interfaces, and UNIX workstation interfaces. The assignment of these architecture elements to branches of the H is depicted in Figure 3-4.

It is understood that every architecture view does not lend itself to this “H” structure. For example, this structure is not appropriate for geographic and organizational architectures. As noted in the discussion of icons, you are advised to follow the morphological conventions wherever practical, but you adapt or omit them where they do not apply.

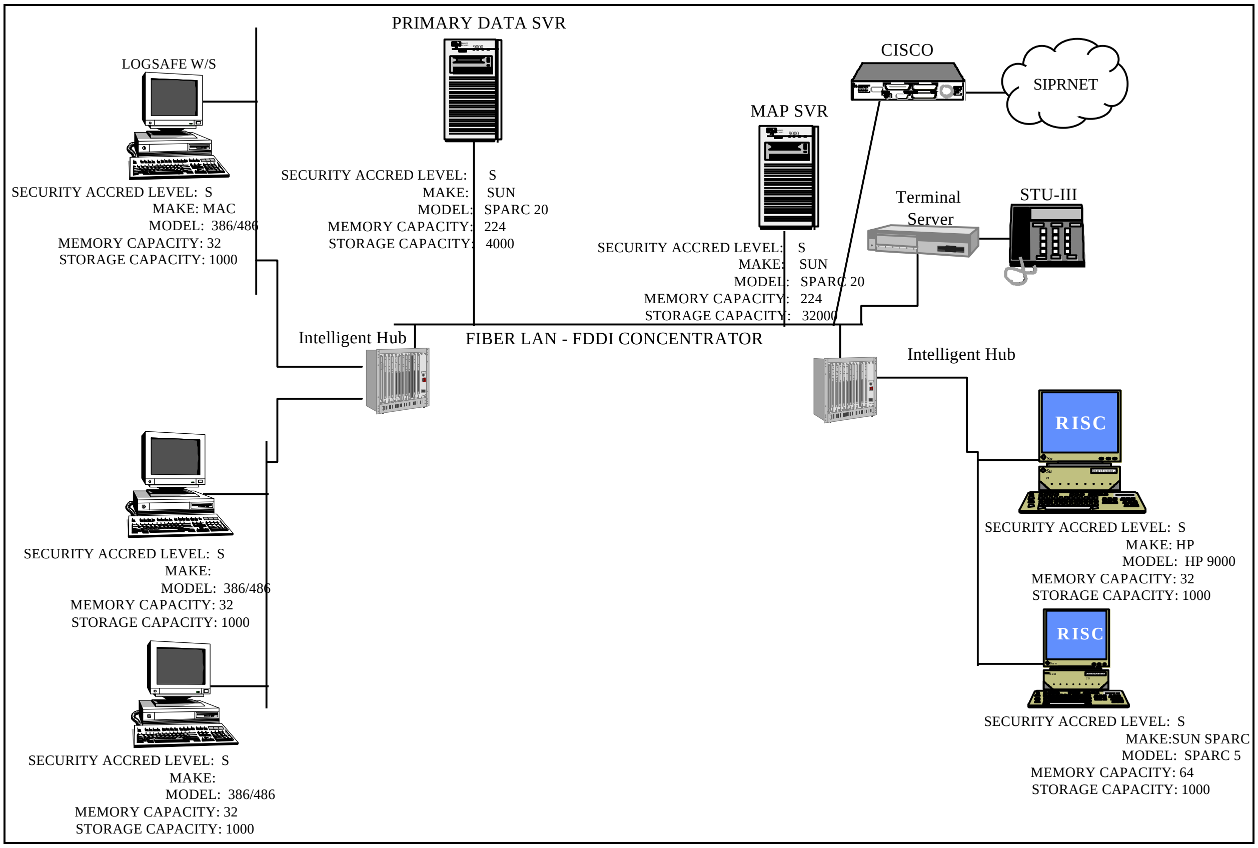


Figure 3-4.
Architectural Morphology - Sample "H" Diagram

Servers on Internal LAN

GCCS servers are depicted in the architectural layout on the top of the center segment, the internal LAN. The number of servers depicted depends on specific site requirements. The initial distribution of GCCS equipment calls for two servers, an application server and a data server. Attribute information should appear below or adjacent to each server icon.

LAN Connectivity and Systems Local to the Organization

The vertical upper left segment identifies all internal LAN connectivity and interfaces, and the equipment at the site that will require an interface to the GCCS architecture. Attribute information should appear below or adjacent to each icon.

External WAN Connectivity

The vertical upper right segment identifies all external WAN connectivity and interfaces. In the near-term GCCS, external connectivity is provided by a CISCO router connected to the SIPRNET and also through a communications or terminal server providing access for remote dial-in users.

DOS/Legacy Workstations

DOS workstations and legacy systems interfacing as clients to GCCS servers are depicted in the vertical lower left segment. The DOS workstation clients are depicted toward the top of the LAN segment. The legacy systems possessing a 80386 processor or higher are depicted toward the bottom of the LAN segment. Attribute information should appear below or adjacent to each icon.

UNIX Workstations

The vertical lower right segment depicts the UNIX workstations interfacing as clients to the GCCS servers. Attribute information should appear below or adjacent to each icon.

Notes, Assumptions, Reference Pointer

The bottom quarter of the drawing area is reserved for textual notes that provide needed explanation or record any assumptions on which the drawing was based. This area also includes a notation of whether additional references or attachments support the drawing.The notes area is highlighted in Figure 3-5.

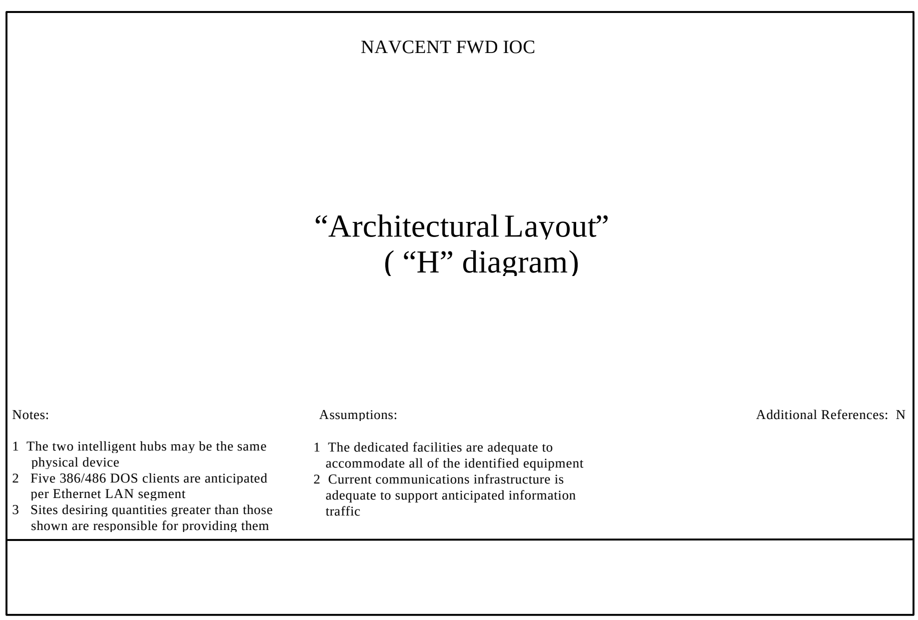


Figure 3-5.
GCCS Notes

The notes area can include comments that the architect deems are important for the reader to be aware of when reviewing the drawing. These notes may highlight details concerning specific system components, or may provide pointers to related information. A very appropriate note would record why the drawing is being done in the first place (e.g., “the admiral sketched this out during a meeting,” or “this drawing is an update of a system baseline dated 8/19/93”). Lengthy notes should be placed on a separate page, and the “additional references” space marked “Y.”

The assumptions section presents some of the basic assumptions that the architect made when designing the layout. The assumptions help to ensure that the reader and the architect are “playing from the same sheet of music.” As with the notes,any lengthy assumptions should be moved to an attachment.

The “additional references” section consists of a space where the preparer places a "Y" or "N" to indicate whether additional references are attached. References can be equipment specifications, related drawings (e.g., the earlier baseline being updated), memoranda, minutes of a meeting, bibliographic references to other relevant documents, or whatever is of value to the those who will make decisions and take actions based on the architecture drawing.

It is not required to list notes or assumptions; however, most drawings arise from a context or ongoing action that it is wise to record. Each drawing must have a “Y” or “N” indicator in the “additional references” space.

Registration Number

The GCCS Architect will assign a registration number to each drawing of record. For a discussion of what drawings to submit to the GCCS Architect, see Section 4.

The registration number has five components:

- Current date
- Current time
- Command/organization
- Specific site (if applicable)
- Service proponent (if applicable).

Creation Date

The date portion of the registration number is the a multidigit representation of the day, the month, and the year the drawing was created. The day and month are each represented by a two-digit code. The year is represented by a two-digit code. The date is in day-month-year format. For example:

Date: 6 January 1995
Code: 060195

Creation Time

The time is the 24 hour clock representation of the hour. Time is rounded off to the nearest hour.

Time: 2:20 PM
Code: 14

Command/Organization

The code for command/organization is a multiletter code which represents the command or organization operationally responsible for the site. The code removes the US from the command/organization name and enters a colon after the remaining characters. For example:

Site
FORSCOM
Responsible Unified Command
USACOM
Code
ACOM:

Specific Site (if Applicable)

The site code is a multiletter code to document the location or name of the site depicted in the drawing. The code removes the US from the site name and enters a colon after the remaining characters. For example:

Site	**Code**
FORSCOM	FORSCOM:

Service Proponent

The service proponent code is the two-letter code designated in the DoD 5000 series for the Service (or agency) designated as the proponent for the command and site. The major Service proponent codes are shown in Figure 3-6.

Service Proponent	Code
Air Force	AF
Army	AR
Navy	NA
Other	OT

Figure 3-6.
Service Proponent Codes

The registration number for the drawing is derived by combining the five codes described above, as shown in Figure 3-7.

Date	**Hour**	**Unified Command**	**Site Code**	**Service Proponent**
060195	14	CENTCOM	CENTCOM	AF

Registration Number:
06019514CENTCOM:CENTCOM:AF

Figure 3-7.
Sample Determination of Registration Number

The registration number appears in the lower right hand corner of the drawing, as depicted in Figure 3-8.

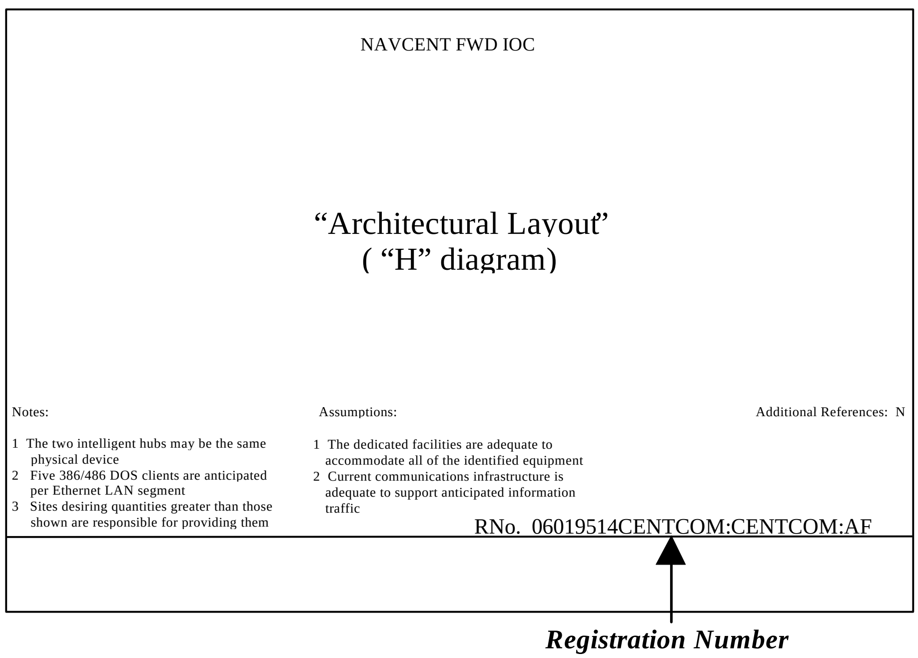


Figure 3-8.
Registration Number

Signature Block

A signature block is a standard feature of GCCS drawings. The signature block is provided for DISA and Service proponent approval and acceptance of the architecture. The procedure by which drawings get signed is described in Section 4. The signature block is located at the bottom left of the drawing, as shown in Figure 3-9.

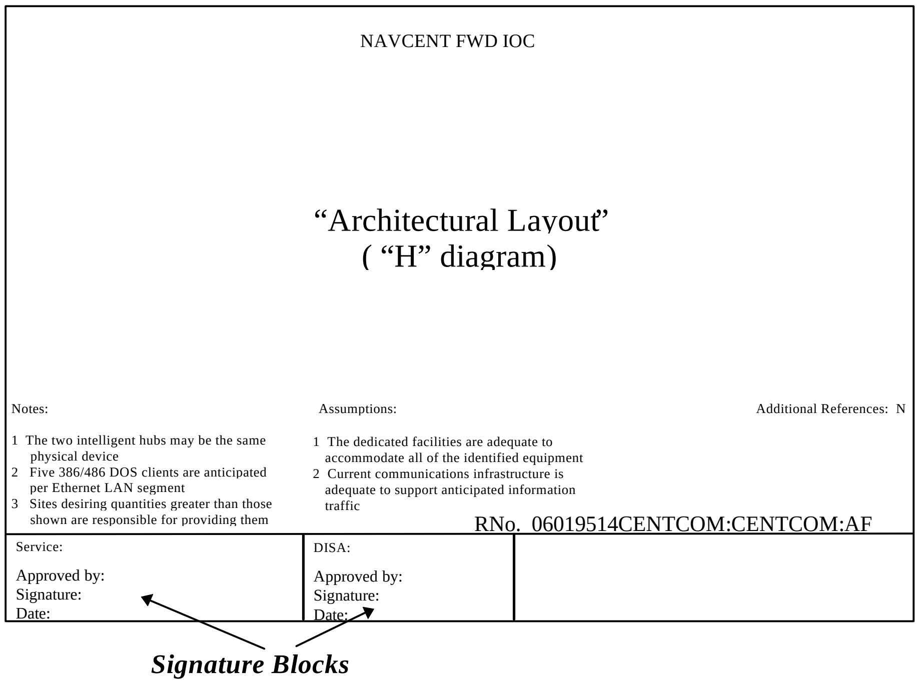


Figure 3-9.
Signature Block

GCCS Version Number

The GCCS version number identifies the iteration of GCCS implementation supported by the architecture drawing. The GCCS version number is placed in the lower right corner, as shown in Figure 3-10.

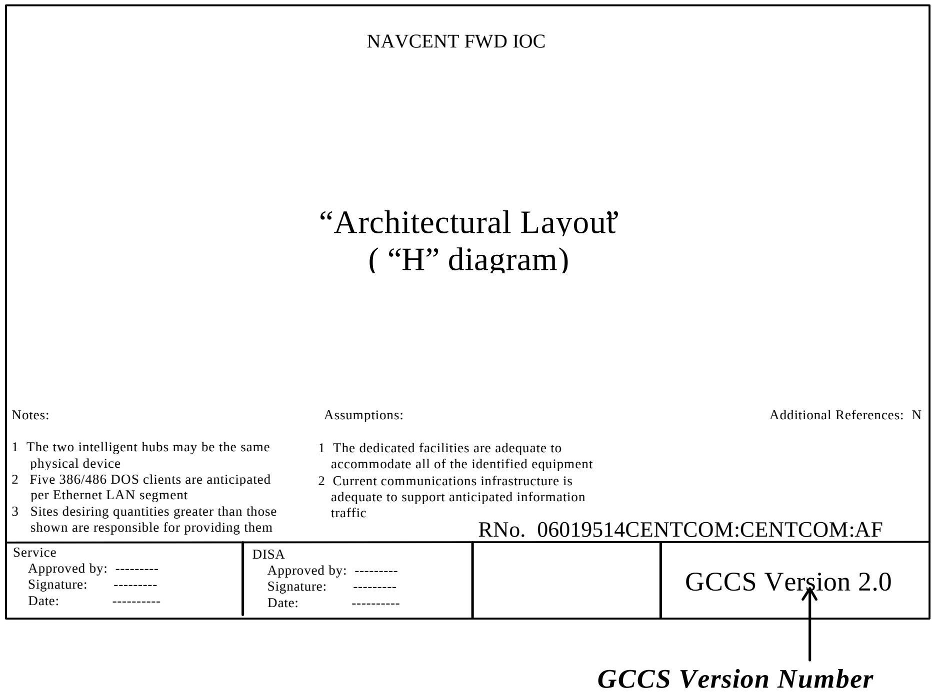


Figure 3-10.
GCCS Version Number

Drawing Tool

The name and version number of the drawing tool used to produce the drawing are placed at the bottom of the drawing between the signature block and the GCCS version number, as illustrated in Figure 3-11.

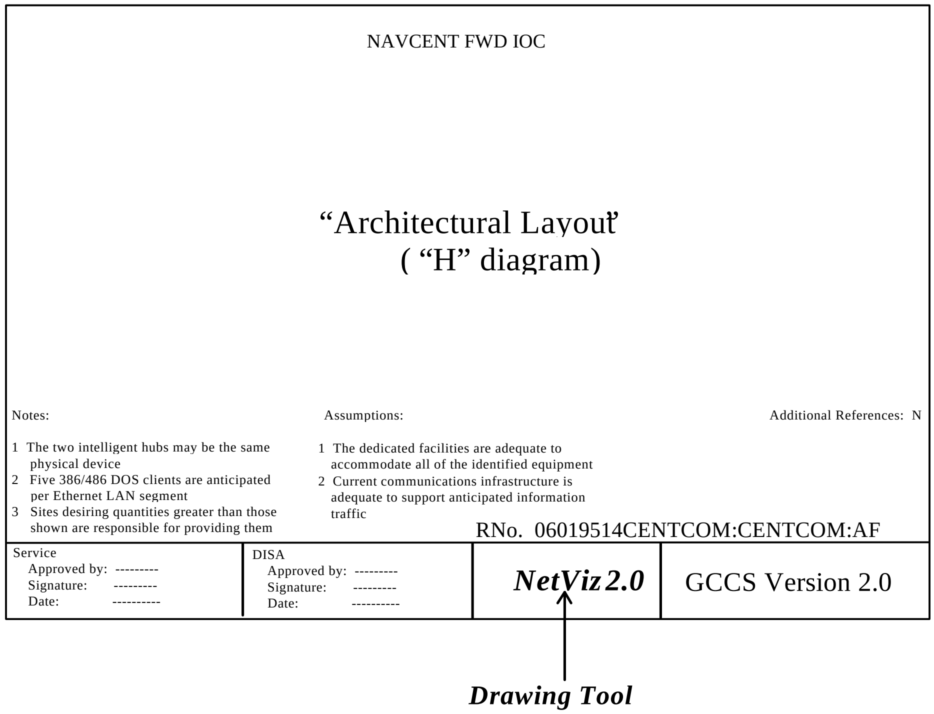


Figure 3-11. Drawing Tool

THE NEXT STEP

At this point in this guidebook you have been given all the building blocks (terminology and icons) of GCCS architecture, and have also received the blueprints and building codes (architecture morphology and other conventions) for putting them together.

The next section focuses on the process of putting these elements to work for you. It also provides some options for creative data management and presentation on the local level and productive use of the centralized GCCS architecture archive.